REMARKS

Claims 1-17 are pending in the application. Claim 16 has been canceled.

The Abstract of the disclosure has been amended to correct a typographical error.

Claims 1, 2, 7, 13, 16, and 17 are rejected under 35 U.S.C. §103(a) as being unpatentable over Jorke (U.S. Patent No. 6,283,597) in view of Eden et al. (U.S. Patent No. 4,599,730). The rejection of claim 16 has become moot by canceling the claim.

Claim 3 is rejected under 35 U.S.C. §103(a) as being unpatentable over Jorke in view of Eden and further in view of applicants' admitted prior art.

Claims 4, 5, 8, and 9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Jorke in view of Eden and further in view of Gibeau et al. (U.S. Patent No. 5,715,021).

Claim 6 is rejected under 35 U.S.C. §103(a) as being unpatentable over Jorke in view of Eden and further in view of Hargis et al. (U.S. Patent No. 6,154,259).

Claim 10 is rejected under 35 U.S.C. §103(a) as being unpatentable over Jorke in view of Eden and Gibeau and further in view of Karakawa (U.S. Patent No. 6,304,237).

Claims 11 and 12 are rejected under 35 U.S.C. §103(a) as being unpatentable over Jorke in view of Eden and further in view of Ohtsuki et al. (U.S. Patent No. 6,590,698).

Claims 14 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Hargis in view of Eden.

Claims 1, 13, 14, and 17 are the remaining independent claims. These claims commonly recite a laser system with a plurality of lasing elements, and imaging optics, wherein the combined laser beams have an ensemble spectrum Λ with an overlap parameter $\gamma = \overline{\Delta\lambda_i} / \overline{S_i}$. $\overline{\Delta\lambda_i}$ is a mean spectral bandwidth of the individual lasing elements, and $\overline{S_i}$ is a mean wavelength shift between the center wavelengths λ_{0i} of different lasing elements. $\overline{\Delta\lambda_i}$ and $\overline{S_i}$ of the array are selected so that $\gamma \geq 1$.

As admitted in the Office Action, Jorke fails to teach that the overlap parameter γ is ≥ 1. In fact, Jorke clearly teaches to have almost no overlap so that different colors and/or different wavelengths within the same color range are distinctly separated (see for example FIG. 2 of Jorke).

The Office Action cites Eden as disclosing a laser that satisfies the criterion $\gamma \geq 1$. However, the Examiner is mistaken in equating the claimed "spectral bandwidth" of a laser line with the full width at half maximum (FWHM) of a laser's gain spectrum. As clearly stated by Eden, a laser on this transition having the 15 nm FWHM "is potentially tunable over a region of 150 Å in the blue-green." (col. 1, lines 37-42). The Examiner's statement that *these lasers can be tuned or slightly modified to the red and blue wavelengths, which are of close proximity in the spectrum to green wavelengths*, is contrary to the taught fundamentals in laser physics. See, for example, the treatise by Anthony E. Siegman, *Lasers*, University Science Books, Mill Valley, CA. Continuous tuning ranges in excess of 20 nm are uncommon. The exemplary excimer laser has in lasing mode a spectral bandwidth in a range of approximately 10 Å, depending on the laser cavity design. Applicants request that the Examiner substantiate his assertion of tuning ranges and spectral bandwidth by citing relevant prior art documents.

Eden teaches a tunable electron-beam-pumped excimer laser system that is capable of emitting, depending on the gas composition, a laser line that is tunable over approximately 15 nm, which is the width of the gain curve. Eden does not suggest having multiple lasing elements, wherein each laser element emits a laser beam with a center wavelength λ_{0i} and a spectral bandwidth $\Delta\lambda_i$. Even if Jorke's essentially monochromatic light sources were replaced by Eden's lasers, the combination of Jorke and Eden still does not teach or suggest a laser system with $\gamma \geq 1$, as recited in the independent claims 1, 13, 14, and 17.

Regarding claim 13, the Examiner further states that the center wavelengths for RGB light are approximately 610-630 nm, approximately 520-540nm, and approximately 450-470 nm, respectively. However, although such wavelength ranges are easily attainable with low intensity continuous light sources, such as filtered incandescent light and LEDs, lasers emit sharp lines with a FWHM of 1 nm (=10 Å) or less, as discussed *supra*. Such sharp emission lines can result in speckle, which the invention overcomes by arranging lasers emitting at

slightly different, but overlapping wavelengths. This is not taught or suggested by the prior art of record.

As stated above, the Examiner appears to confuse "gain bandwidth" with "mean spectral bandwidth of the lasing element." For example, in the Examiner's argument relating to claim 17, the Examiner computes a "mean wavelength shift" between two lasing elements, i.e., the green laser wavelength and the red and blue laser wavelength, as 10 nm. See page 7, line 20, of the Office Action. However, even when accepting the Examiner's association of the lasing elements, the center wavelength λ_{01} of the at least one (green) laser beam is 530 nm, while the center wavelength λ_{02} of the at least one other laser beam (red or blue) is 620 nm and 460 nm, respectively, resulting in a mean wavelength shift $\overline{S_i}$ between the center wavelengths (between λ_{01} and λ_{02}) of the at least one and the at least one other laser beams of (70 + 90)/2 nm = 80 nm, and not 10 nm as stated by the Examiner. Even if the mean spectral width of the laser beams were assumed to be 20 nm (which they are not, because laser line widths are typically less than 1 nm, as discussed *supra*), as asserted by the Examiner (450-470 nm in the blue, 520-540 nm in the green, and 610-630 nm in the red), this would give a value for γ of $\gamma = 20/80 = 1/4$, which is less than 1 and thus falls outside the range of $\gamma \geq 1$ recited in the independent claims 1, 13, 14, and 17.

Gibeau was cited as teaching a projection system having a two-dimensional array of semiconductor diode lasers. However, the paragraph cited by the Examiner (col. 12, lines 26-39) clearly states that the semiconductor stripe laser diodes form a linear array 702.

Ohtsuki was cited as teaching use of a fly-eye lens. Hargis was cited as teaching an image projection system using (linear arrays of) microlasers or diode lasers. Speckle is reduced by using randomizing media, such as spinning diffusion plates, flowing fluid diffusers, non-flowing fluid diffusers, and nutating diffusion plates.

Neither Gibeau, nor Ohtsuki or Hargis, teach wavelength-shifted laser elements with $\gamma \geq 1$.

Accordingly, none of the references of record, taken either alone or in combination, teach or suggest the features recited in the independent claims 1, 13, 14, and 17, which are therefore patentable. The retained dependent claims 2-12 and 15 depend on claim 1 and 15, respectively, and are patentable for the same reasons that claims 1 and 14 are patentable.

In view of the above amendment, Applicants believes the pending application is in condition for allowance.

Applicants believe no fee is due with this response. However, if a fee is due, please charge our Deposit Account No. 18-1945, under Order No. CLOG-P01-002 from which the undersigned is authorized to draw.

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Respectfully submitted,

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